



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/590,442

08/24/2006

Masato Honma

HRK-001

8952

20374 7590 12/28/2010
KUBOVCIK & KUBOVCIK
SUITE 1105
1215 SOUTH CLARK STREET
ARLINGTON, VA 22202

EXAMINER

FEELY, MICHAEL J

ART UNIT

PAPER NUMBER

1761

MAIL DATE

DELIVERY MODE

12/28/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/590,442	Applicant(s) HONMA ET AL.	
	Examiner Michael J. Feely	Art Unit 1761	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 11-49 is/are pending in the application.
 4a) Of the above claim(s) 17-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Pending Claims

Claims 1-4 and 11-49 are pending.

Election/Restrictions

1. Claims 17-49 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim.

Election was made **without** traverse in the reply filed on April 20, 2009.

Claim Interpretation

2. In claims 1-4, 11 and 12 the recitation “*for carbon-fiber-reinforced composite materials,*” has been given little patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

In the instant case, the preamble merely recites the intended use of the composition, wherein the prior art can meet this future limitation by merely being capable of such intended use.

3. The amended claims are drawn to a composition comprising components [A], [B], [C], [D], and an optional component [E]. The composition is further limited with the following

Art Unit: 1761

proviso: “wherein a content of a compound other than the components [A], [B], [C], [D], and the optional thermoplastic [E] in the epoxy resin composition is 5% by weight or less.” It is important to note that this proviso limits a compound other than [A]-[E] – not all compounds other than [A]-[E]. It is also important to note that the transitional language of the instant invention is open (comprising). Therefore, the scope of the instantly claimed composition is open to:

- a compound other than [A]-[E] provided in an amount of 5% by weight or less; and
- other compounds other than [A]-[E] provided in any amount, as long as a compound other than [A]-[E] is provided in an amount of 5% by weight or less.

Furthermore, the range of 5% by weight or less includes zero. Accordingly, the material identified as a compound other than [A]-[E] can be satisfied by an optional material that is not included at all.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-4, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honda et al. (US Pat. No. 5,994,429) in view of Nawakowski et al. (US Pat. No. 3,386,956).

Regarding claims 1, 3, and 4, Honda et al. disclose: **(1)** an epoxy resin composition (Abstract) for carbon-fiber-reinforced composite materials (capable of intended use: column 3, line 65 through column 4, line 21), comprising the following components [A], [B], [C], and [D]:

[A] epoxy resin (Abstract; column 2, lines 22-35),

Art Unit: 1761

[B] amine curing agent (Abstract; column 2, lines 36-44) which is dicyandiamide (Abstract; column 2, lines 36-44; Example 3),

[C] phosphorus compound (Abstract; column 2, line 45 through column 3, line 23), wherein the concentration of the component [C] is 0.2 to 15% by weight in terms of phosphorus atom concentration (column 3, lines 31-40), and

[D] a curing accelerator (column 3, lines 55-64); and

[E] an optional thermoplastic resin (optional component not required);

wherein a content of a compound other than the components [A], [B], [C], [D], and the optional thermoplastic resin [E] in the epoxy composition is 5% by weight or less (optional component not required – see 0%; see also column 3, lines 20-23 & 38-40: resin covering layer would account for approximately 0.005-6% by weight);

(3) characterized by comprising red phosphorus as the component [C] (Abstract; column 2, line 45 through column 3, line 23); and (4) characterized in that the red phosphorus is coated with a metal hydroxide and/or a resin (Abstract; column 2, line 45 through column 3, line 23).

Honda et al. contemplate the use of any curing accelerator, as long as it is generally used in accelerating curing of an epoxy resin (see column 3, lines 55-64). However, they fail to disclose: (1) [D] 1,1'-4(methyl-m-phenylene)bis(3,3-dimethylurea).

Nawakowski et al. disclose a similar epoxy-based composition used as an impregnant (see column 1, lines 10-27; column 7, lines 12-18; claims). Furthermore, they disclose that the instantly claimed urea-based accelerator is recognized in the art as a suitable accelerator for this type of epoxy/dicyandiamide system (see Example III in Table 1; claim 5). As with accelerators in general, they are used to increase the rate of cure. In light of this, it has been found that the

Art Unit: 1761

selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination – see MPEP 2144.07.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the instantly claimed urea-based accelerator, as taught by Nawakowski et al., in the composition of Honda et al. because: (a) Honda et al. contemplate the use of any curing accelerator, as long as it is generally used in accelerating curing of an epoxy resin; and (b) the teachings of Nawakowski et al. establish that the instantly claimed urea-based accelerator is recognized in the art as a suitable accelerator for this type of system.

Regarding claims 2, 11, and 12, the combined teachings of Honda et al. and Nawakowski et al. are as set forth above and incorporated herein. They fail to explicitly disclose: **(2)** characterized in that the viscosity of the composition is 10 to 700 Pa's at 60°C; **(11)** characterized in that the specific gravity of the composition is 1.35 or lower; **(12)** characterized in that the composition can be cured within 30 minutes at 150°C.

It appears that the composition of the combined teachings would have satisfied these properties because it satisfies all of the material/chemical limitations of the instant invention. This is particularly the case where little to no inorganic filler is present (see column 3, lines 31-40 of Honda et al.). In light of this, it has been found that, “Products of identical chemical composition can not have mutually exclusive properties.” A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present – In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Art Unit: 1761

Therefore, it appears that the composition of the combined teachings would have satisfied the instantly claimed properties because it satisfies all of the material/chemical limitations of the instant invention.

6. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honda et al. (US Pat. No. 5,994,429) in view of Nawakowski et al. (US Pat. No. 3,386,956) and Middleman (US Pat. No. 5,269,863).

Regarding claims 13, 15, and 16, the combined teachings of Honda et al. and Nawakowski et al. are as set forth above and incorporated herein. Honda et al. contemplate the use of glass fabric or cloth to manufacture their prepreg. These prepreps are then used to manufacture multi-layer circuit boards (see column 3, line 65 through column 4, line 21). However, they fail to disclose: **(13)** a prepreg, prepared by impregnating carbon fiber with the epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1; **(15)** a fiber-reinforced composite sheet, characterized by comprising a cured resin prepared by curing the epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1; and carbon fiber; and **(16)** a fiber-reinforced composite sheet, prepared by curing a prepreg according to claim 13.

Middleman discloses similar prepreg materials used to manufacture multi-layer circuit boards (see column 3, lines 9-25; column 4, lines 33-46). The teachings of Middleman establish that carbon fibers/fabrics, in addition to glass fibers/fabrics are recognized in the art as suitable reinforcing materials for circuit board prepreps. They are functional equivalent materials used to reinforce the prepreg/circuit board structure. In light of this, it has been found that substituting functional equivalents known for the same purpose is prima facie obvious – see MPEP 2144.06.

Art Unit: 1761

Such a substitution would have obviously satisfied the instantly claimed invention, as set forth in claims 13, 15, and 16.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the glass fiber/fabric of Honda et al. (in view of Nawakowski et al.) with carbon/fiber fabric because the teachings of Middleman establish that carbon fiber/fabrics, in addition to glass fiber/fabrics are recognized in the art as suitable reinforcing materials for circuit board prepregs. They are functional equivalent materials used to reinforce the prepreg/circuit board structure.

Regarding claim 14, the combined teachings of Honda et al. and Nawakowski et al. are as set forth above and incorporated herein. Honda et al. fail to disclose: (14) characterized in that the fiber volume content of a prepreg is 30 to 95%.

The teachings of Middleman further establish that the instantly claimed fiber volume content is recognized as a suitable fiber volume content for this type of application (see column 4, lines 47-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the instantly claimed fiber volume content in the prepreg of Honda et al. (in view of Nawakowski et al.) because: (a) the teachings of Middleman establish that carbon fiber/fabrics, in addition to glass fiber/fabrics are recognized in the art as suitable reinforcing materials for circuit board prepregs; and (b) the teachings of Middleman further establish that the instantly claimed fiber volume content is recognized in the art as a suitable fiber volume content for this type of application.

Response to Arguments

7. Applicant's arguments filed 22 October 2010 have been fully considered but they are not persuasive.

Applicant argues that the new proviso distinguishes the instant invention from the composition of Honda et al. Specifically, they argue: (a) that the inorganic filler of Honda et al. is an indispensable component; (b) that the inorganic filler of Honda et al. is provided in amounts greater than 5% by weight; and (c) that the inorganic filler of Honda et al. (and amounts thereof) teach away from the new proviso, "wherein a content of a compound other than components [A], [B], [C], [D], and the optional thermoplastic resin [E] in the epoxy resin composition is 5% by weight or less."

The Office agrees with (a) and (b); however, the Office respectfully disagrees with (c) for the reasons set forth above in section 3 of the instant Office action:

The amended claims are drawn to a composition comprising components [A], [B], [C], [D], and an optional component [E]. The composition is further limited with the following proviso: "wherein a content of a compound other than the components [A], [B], [C], [D], and the optional thermoplastic [E] in the epoxy resin composition is 5% by weight or less." It is important to note that this proviso limits a compound other than [A]-[E] – not all compounds other than [A]-[E]. It is also important to note that the transitional language of the instant invention is open (comprising). Therefore, the scope of the instantly claimed composition is open to:

- a compound other than [A]-[E] provided in an amount of 5% by weight or less; and

Art Unit: 1761

- other compounds other than [A]-[E] provided in any amount, as long as a compound other than [A]-[E] is provided in an amount of 5% by weight or less.

Furthermore, the range of 5% by weight or less includes zero. Accordingly, the material identified as a compound other than [A]-[E] can be satisfied by an optional material that is not included at all.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 1761

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is (571)272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael J Feely/
Primary Examiner, Art Unit 1761

December 23, 2010